

**IN THE UNITED STATES DISTRICT COURT
FOR THE MIDDLE DISTRICT OF TENNESSEE
NASHVILLE DIVISION**

J.H., By Conservator BETTY HARRIS,)	
)	
Plaintiff,)	
)	
v.)	Case No. 3:14-cv-02356
)	Judge Aleta A. Trauger
JUAN CRUZ,)	
)	
Defendant.)	

**MEMORANDUM AND ORDER ON MOTION TO EXCLUDE THE
TESTIMONY AND FINDINGS OF GREGORY FORT**

Before the court is defendant Juan Cruz’s Motion in Limine to Exclude the Testimony of Gregory Fort, the DNA Findings of the Tennessee Bureau of Investigation (“TBI”), and any other Conclusions of Fort with Regard to DNA Evidence (Doc. No. 455). The plaintiff opposes the motion. (Doc. No. 532.) The defendant has filed a Reply. (Doc. No. 534.) Neither party has requested oral argument or an evidentiary hearing on this motion. As set forth herein, the motion will be granted in part and denied in part.

I. STANDARD OF REVIEW

A. Motions in Limine

Using its inherent authority to manage the course of trials before it, this court may exclude irrelevant, inadmissible, or prejudicial evidence through in limine rulings. *Luce v. United States*, 469 U.S. 38, 41 n.4 (1984) (citing Fed. R. Evid. 103(c)); *Louzon v. Ford Motor Co.*, 718 F.3d 556, 561 (6th Cir. 2013). Unless such evidence is patently “inadmissible for any purpose,” *Jonasson v. Lutheran Child & Family Servs.*, 115 F.3d 436, 440 (7th Cir. 1997), however, the “better practice” is generally to defer evidentiary rulings until trial, *Sperberg v. Goodyear Tire & Rubber Co.*, 519

F.2d 708, 712 (6th Cir. 1975), so that “questions of foundation, relevancy and potential prejudice may be resolved in proper context,” *Gresh v. Waste Servs. of Am., Inc.*, 738 F. Supp. 2d 702, 706 (E.D. Ky. 2010). A ruling in limine is “no more than a preliminary, or advisory, opinion.” *United States v. Yannott*, 42 F.3d 999, 1007 (6th Cir. 1994) (citing *United States v. Luce*, 713 F.2d 1236, 1239 (6th Cir. 1983), *aff’d*, 469 U.S. 38 (1984)). Consequently, the court may revisit its in limine rulings at any time and “for whatever reason it deems appropriate.” *Id.* (citing *Luce*, 713 F.2d at 1239).

B. Rule 702

The defendant has filed a motion in limine that seeks to exclude the plaintiff’s proposed DNA expert, arguing that his opinions do not meet the standards of Federal Rule of Evidence 702 and *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993).

On a motion to exclude, the party offering an expert’s opinion bears the burden of establishing the admissibility of that opinion by a preponderance of the evidence. *Nelson v. Tenn. Gas Pipeline Co.*, 243 F.3d 244, 251 (6th Cir. 2001). Expert testimony is admissible only if it satisfies the requirements of Federal Rule of Evidence 702, which provides that “[a] witness who is qualified as an expert by knowledge, skill, experience, training, or education may testify in the form of an opinion or otherwise if (a) the expert’s scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue; (b) the testimony is based on sufficient facts or data; (c) the testimony is the product of reliable principles and methods; and (d) the expert has reliably applied the principles and methods to the facts of the case.” “The same set of questions applies to expert testimony and science-based test results.” *United States v. Gissantaner*, 990 F.3d 457, 463 (6th Cir. 2021) (citation omitted). Under Rule 702, the trial judge acts as a gatekeeper to ensure that expert evidence is both reliable and relevant. *Johnson v. Manitowoc Boom Trucks, Inc.*, 484 F.3d 426, 429 (6th Cir. 2007).

“Parsing the language of the Rule,” the Sixth Circuit has concluded that “a proposed expert’s opinion is admissible, at the discretion of the trial court,” if (1) the proposed witness is “qualified by ‘knowledge, skill, experience, training, or education’”; (2) the testimony is “relevant, meaning that it ‘will assist the trier of fact to understand the evidence or to determine a fact in issue’”; and (3) the testimony is “reliable.” *In re Scrap Metal Antitrust Litig.*, 527 F.3d 517, 528–29 (6th Cir. 2008) (quoting Fed. R. Evid. 702.) The Sixth Circuit has made clear that the questions of whether the proposed scientific evidence is “the product of reliable principles and methods” and whether the proposed expert has reliably applied those principles and methods are two distinct questions. *Gissantaner*, 990 F.3d at 463, 467.

Generally, in determining whether scientific evidence is reliable, the court’s focus “must be solely on principles and methodology, not on the conclusions that they generate.” *Daubert*, 509 U.S. at 595. The Supreme Court identified a non-exhaustive list of factors that may help courts in assessing the reliability of a proposed expert’s opinion, including: (1) whether a theory or technique can be or has been tested; (2) whether the theory has been subjected to peer review and publication; (3) whether the technique has a known or potential rate of error; and (4) whether the theory or technique enjoys “general acceptance” within a “relevant scientific community.” *Id.* at 592–94. The *Daubert* factors “are not dispositive in every case and should be applied only where they are reasonable measures of reliability of expert testimony.” *Scrap Metal Antitrust Litig.*, 527 F.3d at 529 (internal quotation marks and citation omitted). At the same time, “rejection of expert testimony is the exception, rather than the rule.” *Scrap Metal Antitrust Litig.*, 527 F.3d at 530. “Vigorous cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof are the traditional and appropriate means of attacking shaky but admissible evidence.” *Daubert*, 509 U.S. at 596.

II. BACKGROUND

Plaintiff JH, then a minor, accused defendant Cruz of sexually assaulting him on December 7, 2013, while JH was incarcerated at the Williamson County Juvenile Detention Center. As part of the investigation into his allegations, a detective with the Williamson County Sheriff's Office ("WCSO") collected DNA samples from both JH and Cruz, some on the day the plaintiff made his initial allegations and some a few days later.

Special Agent Gregory Fort, a forensic biologist employed by the TBI, conducted testing on these samples in May and June 2014 and, on July 10, 2014, generated an Official Forensic Biology Report ("Official Report") summarizing his conclusions. (*See* Doc. No. 455-1, at 5 (referencing the preparation of an Official Report).) This Official Report does not appear to have been filed by either party. In the context of this civil case, Fort had a meeting with plaintiff's counsel, who then prepared a report essentially summarizing his training and background and what he had told her about his investigation. (Doc. No. 455-2, Fort Dep. 37.¹) Fort looked over the report prepared by counsel, made some corrections to it, and signed it. (*Id.*) The court presumes—but is not entirely sure—that this is the Report of Special Agent Gregory Fort ("Report"), signed and dated September 22, 2017, that has been filed by the defendant and is the subject of the present Motion in Limine. (Doc. No. 455-1.)² The court also presumes that this Report is part of the plaintiff's Rule 26(a)(2) expert disclosure, though the document filed with the court does *not*

¹ It is impossible to read the original page numbers on Fort's deposition transcript, as the court reporter's footer is covered by the court's CM/ECF footer. The court, therefore, refers to this transcript by the page numbers assigned by CM/ECF, which do not appear to be consistent with those assigned by the court reporter.

² Although the deposition transcript of the Fort was filed by the defendant in support of his Motion in Limine, and the title given to the document by the defendant when it was filed with the court's electronic docketing system is "Exhibit Fort Depo with Exhibits," no exhibits were filed with the transcript.

include all the facts and data considered by the witness in forming his opinions or any of the exhibits he used to support or summarize them, which he presumably submitted with his disclosure, as required by Rule 26. In any event, Fort has also now been deposed by the defendant, and the defendant has not raised any objection based on a failure to comply with Rule 26(a)(2).

The Report sets forth Fort's background, training, and experience and provides his opinions regarding the DNA analysis he performed on the samples collected by the WCSO. (Doc. No. 455-1, at 1.) The Report explains that the samples were collected on swabs and are referred to as Exhibits 1a, 1b, 1c, and 1d (respectively: lip, mouth, penile, and underwear swabs from the plaintiff JH, collected on December 7, 2013); 2a, 2b, and 2c (lip, mouth, and penile swabs from defendant Cruz, collected on December 7, 2013); 3a; and 4a (buccal³ swabs from the plaintiff and Cruz, collected on December 10, 2013). (*Id.* at 2.) These samples were submitted to the TBI by the WCSO with a request that they be tested. The request stated:

Please complete DNA profiles on all items, once completed please compare the known DNA standard from the victim [Exhibit 3a] . . . against the profiles completed from [Exhibits 2a, 2b, and 2c, the swabs collected from Cruz] for match. Also compare the DNA profile from the known standard from Juan Cruz [Exhibit 4a] against [Exhibits 1a, 1b, 1c, and 1d] for match.

(*Id.* at 2.)

Fort commenced testing on the samples on May 27, 2014 and completed testing on July 2, 2014. He states that, once he completes his testing and analysis, a "technical review and administrative review" are performed before his results are released to local law enforcement. (*Id.*)

Fort states that, because there was no request for "touch DNA," his first step in testing was

³ "Buccal" simply means of or relating to the cheek or the mouth. See <https://www.merriam-webster.com/dictionary/buccal>. Buccal swabs are typically collected from the inside of a person's cheek for the purpose of establishing a person's known DNA profile. (See Fort Dep., Doc. No. 455-2, at 71.)

to determine whether there was blood, semen, or saliva present on the samples (or “specimens”). To do this, he tested the penile swabs for both JH and Cruz for the presence of alpha amylase, a digestive enzyme found in saliva, urine, and feces, using the radial diffusion process. The Report’s explanation of the radial diffusion methodology is cursory at best,⁴ but Fort’s ultimate conclusion from the procedure was that the test on JH’s penile swab revealed the presence of alpha amylase and that the amount of alpha amylase was “more consistent with saliva than it was for urine or feces.” (Doc. No. 455-1, at 3.) His Report states: “It is my opinion with a reasonable degree of scientific certainty that the Alpha Amylase results from serology testing were from saliva.” (*Id.*)⁵

Fort then tested for the presence of DNA on the samples. His Report states that DNA was detected on Exhibits 1c and 1d, from JH’s penile and underwear swabs. Swabs 3a and 4a were buccal swabs taken from the plaintiff and the defendant to be used as known standards for comparison purposes. (*Id.*) Fort’s Report explains that the buccal swabs were used to build DNA profiles for both JH and Cruz. (*Id.*)

Fort’s Report includes a short primer on “Basic DNA Science,” explaining that

Electrophoresis is a technique used in labs to separate charged molecules, like DNA. The result is a graph called an electropherogram which is now commonly used to determine a DNA sequence and allele position. A genetic marker or locus indicates the position of DNA on a chromosome. The word “loci” is often used to describe the genetic markers used for DNA testing. Typically, there are two numbers describing the phenotypes on each marker or locus. When only one single number shows on a specific marker, the tested person has two copies of the same marker. An allele is one of many forms that a genetic marker may take. DNA (deoxyribonucleic acid) markers may differ in size or in the arrangement of the molecules (A, T, C and G). These differences make each person’s DNA profile unique. The data in a DNA report typically shows two allele sizes as numbers at each locus for each person, one allele contributed by the person’s biological mother

⁴ He explains it more completely in his deposition testimony.

⁵ Fort’s Report does not actually specify that the positive alpha amylase finding was only from JH’s penile swab. (*See generally* Doc. No. 455-1.) However, in his deposition, he testified that the amylase tests on Cruz’s penile swab were negative. (Fort Dep., Doc. No. 455-2, at 86.)

and the other allele contributed by the person's biological father. By convention, when two alleles at a locus are the same, the number is shown only once.

An allele is a viable DNA coding that occupies a given locus (position) on a chromosome. . . The alleles appear as peaks on the electropherogram.

(Doc. No. 455-1, at 3–4.)

Fort also distinguishes between “two different investigative threshold levels”: the “analytic threshold,” or “detection threshold,” and the “stochastic threshold,” or “reporting threshold.” (*Id.* at 4.) Fort's Report does not clearly explain the science behind these distinctions, but it suggests that the stochastic threshold establishes a higher level of statistical reliability, at which alleles that may be detectable at the analytical threshold “drop out” and are not considered or detected at the stochastic threshold.⁶ He states that, in this case, Exhibit 1c (consisting of the JH penile swabs) was analyzed at the stochastic level only, and Exhibit 1d (JH underwear swabs) was analyzed at both the analytical and stochastic thresholds.

According to Fort, his testing of Exhibit 1c revealed a “limited amount of human DNA . . . consistent with the presence of two contributors.” (*Id.* at 4.) He explains that, by comparing the “known DNA profile of [JH] to the profile from the penile swab [1c], [he] was able to identify genome alleles present that were outside of [JH's] DNA profile.” (*Id.*) “These are identified as alleles of the minor contributor in the penile swab profile.” (*Id.*) His Report states that, if any of the alleles remaining after eliminating those that may have been contributed by JH were *not* present in Cruz's known DNA profile, then “Cruz would be eliminated as a contributor.” (*Id.*) However, according to Fort, “the allele markers were consistent with the known DNA profile of Juan Cruz,” as a result of which Cruz could not be eliminated as a potential contributor. (*Id.* at 4, 5.) Fort's

⁶ In his deposition, he disagreed with the characterization of a finding above the stochastic threshold as more reliable. (Doc. No. 455-2, at 55.) But he also agreed that “DNA may not behave as expected below the stochastic threshold.” (*Id.* at 138.)

Report illustrates this point by referencing the electropherogram charts produced from the various specimens, not all of which have been submitted to the court.

Fort concludes his analysis of the JH penile swab by referencing the FBI's requirement that any comparison analysis be accompanied by a report of the "probability of another person having the profile presented by Juan Cruz within different ethnic genomes." (Doc. No. 455-1, at 5.) He states that the

probability of randomly selecting an unrelated individual who would be included as a contributor to the DNA mixture profile is approximately 1 in 2,109 for the African American population, 1 in 759 for the Caucasian population, and 1 in 10,320 for the Southwestern Hispanic population.

(*Id.* at 6.) He also concludes that the minor contributor is "with scientific certainty" male and cannot be female.

Fort also reports that he obtained a DNA profile from Exhibit 1d, JH's underwear. He obtained sufficient markers from testing that particular specimen to state with confidence that the DNA profile was "consistent with a mixture of at least two individuals," a "major contributor" and a "minor contributor," but the information he obtained was too limited to conduct further interpretation of the results or to identify the contributors. (*Id.*)

Fort's Report states that, following his investigation, he generated an "Official Forensic Biology Report," dated July 10, 2014, that summarized his conclusions, as follows:

- (1) The JH penile swab, Exhibit 1c, indicates the presence of alpha amylase.
- (2) The DNA profile obtained from Exhibit 1c is consistent with a mixture of at least two individuals, a major contributor and a minor contributor. The DNA profile of the major contributor matched the DNA profile known to be that of JH, obtained from Exhibit 3a, and the minor contributor's profile is "consistent with" Cruz's profile, obtained from Exhibit 4a, within the probabilities set forth above. Fort states that his summary is "correct within a reasonable degree of scientific certainty." (Doc. No. 455-1, at 6.)
- (3) The partial DNA profile for the minor contributor was not eligible at the time for entry into the "CODIS database," the Combined DNA Index System, which

stores DNA profiles for a wide variety of individuals and requires a certain minimum threshold amount of DNA for submission. According to Fort, this threshold changes over time, and the DNA obtained for the minor contributor would now meet the current criteria. (*Id.*)

Fort concludes his Report with an averment that the TBI Crime Lab “meets all certifications required by the Federal Bureau of Investigation.” (*Id.*)

The defendant has filed a Motion in Limine and supporting Memorandum in which he argues that: (1) Fort should not be permitted to use the phrase “to a reasonable degree of scientific certainty” when testifying (Doc. No. 456, at 6); (2) Fort’s conclusions that his alpha amylase testing determined the presence of saliva are not “the product of the reliable application of reliable scientific principles and methods; (3) Fort’s conclusions regarding the testing and interpretation of the mixed DNA profile generated in this case are not the product of the reliable application of reliable scientific principles and methods; and (4) Fort’s proposed testimony should be excluded under Rule 403 of the Federal Rules of Evidence. The defendant does not object to Fort’s opinion regarding the inclusion of the DNA fragment in CODIS.

In his response, the plaintiff generally contends that Fort’s testimony is admissible under Rules 702 and 403 and that the defendant’s more specific objections do not provide grounds for excluding Fort’s testimony.

III. DISCUSSION

A. The Use of the Phrase “Within a Reasonable Degree of Scientific Certainty”

Fort’s Report—which, it should be recalled, was actually drafted by the plaintiff’s attorney—repeatedly resorts to the phrase “within [or with] a reasonable degree of scientific certainty.” (*See* Doc. No. 455-1, at 3, 5 (twice), 6.) The defendant argues that Fort should not be permitted to use this expression in his trial testimony, because it (1) has no scientific meaning and is, instead, an “imprecise, subjective phrase that provides no meaningful or useful insight into the

strength or weakness of scientific conclusions” (Doc. No. 456, at 6); and (2) multiple sources have recognized that this phrase “has no place in the judicial process” (*id.* (citing National Commission on Forensic Science, *Testimony Using the Term “Reasonable Scientific Certainty”* (available at <https://www.justice.gov/archives/ncfs/file/795336/download>) (filed by the defendant at Doc. No. 455-1, at 1–5);⁷ Department of Justice Memorandum, *Recommendations of the National Commission on Forensic Science; Announcement for NCFS Meeting Eleven* (Sept. 6, 2016) (hereafter “DOJ Memorandum”) (available at <https://www.justice.gov/opa/file/891366/download>) (filed by the defendant at Doc. No. 455-1, at 6–7);⁸ President’s Council of Advisors on Science and Technology, *Forensic Science in Criminal Courts: Ensuring Scientific Validity of Feature-Comparison Methods* (hereinafter “PCAST Report”) 19, 145 (2016) (Doc. No. 455-6).)

In his Response, Fort asserts that his deposition testimony clarified that, by giving an opinion “to a reasonable degree of scientific certainty,” he meant that his opinion “would be generally accepted by others in the field with [his] same degree of training, education, and experience.” (*See* Doc. No. 432, at 10 (quoting Fort Dep. 21).) He also asserts that, “[a]s recently as 2016, the Sixth Circuit allowed an opinion of a DNA expert that was made to a ‘reasonable

⁷ The National Commission on Forensic Science (“NCFS”) was a Federal Advisory Committee established by the Department of Justice in 2013, whose charter expired on April 23, 2017. *See* <https://www.justice.gov/archives/ncfs>. As explained on the Department of Justice’s website, the NCFS was established

in partnership with the National Institute of Standards and Technology (NIST), to enhance the practice and improve the reliability of forensic science. . . .

The Commission included federal, state and local forensic science service providers; research scientists and academics; law enforcement officials; prosecutors, defense attorneys and judges; and other stakeholders from across the country.

Id.

⁸ The effect of the DOJ Memo was to accept the NCFS’s final recommendations regarding the use of the phrase “reasonable degree of scientific certainty.”

degree of scientific certainty’ in refusing to exclude DNA evidence” (Doc. No. 532, at 11 (quoting *United States v. Eastman*, 645 F. App’x 476, 478 (6th Cir. 2016))), and that, in any event, this is not a basis for excluding his opinion.

Regarding the second and third of the plaintiff’s contentions, the defendant does not actually posit that the use of this phrase provides a basis for excluding Fort’s testimony altogether; he simply objects to the use of that phrase in connection with the presentation of Fort’s opinions. And in *Eastman*, the Sixth Circuit opinion to which the defendant refers, the court noted that the government expert used the expression in presenting his opinion as to whether the defendant’s DNA was on a particular piece of evidence. The court, however, did not address the appropriateness of the use of this phrase, because the defendant did not challenge it.

And the plaintiff’s first contention—that Fort clarified in his deposition what he meant by the expression “reasonable degree of scientific certainty”—tends to substantiate the defendant’s objection that the phrase is inherently subjective and unscientific. The court is persuaded, having considered the articles submitted by the defendant and the judicial opinions cited therein, that the phrase “to a reasonable degree of scientific certainty” should not be used by the plaintiff’s (or any) expert. As the NCFS explained:

Forensic discipline conclusions are often testified to as being held “to a reasonable degree of scientific certainty” or “to a reasonable degree of [discipline] certainty.” These terms have no scientific meaning and may mislead factfinders about the level of objectivity involved in the analysis, its scientific reliability and limitations, and the ability of the analysis to reach a conclusion. Forensic scientists, medical professionals and other scientists do not routinely express opinions or conclusions “to a reasonable scientific certainty” outside of the courts. Neither the *Daubert* nor *Frye* test of scientific admissibility requires its use, and consideration of caselaw from around the country confirms that use of the phrase is not required by law and is primarily a relic of custom and practice. There are additional problems with this phrase, including:

- There is no common definition within science disciplines as to what threshold establishes “reasonable” certainty. Therefore, whether couched as

“scientific certainty” or “[discipline] certainty,” the term is idiosyncratic to the witness.

- The term invites confusion when presented with testimony expressed in probabilistic terms. How is a lay person, without either scientific or legal training, to understand an expert’s “reasonable scientific certainty” that evidence is “probably” or possibly linked to a particular source?

NCFS *Recommendation to the Attorney General: Use of the Term “Reasonable Scientific Certainty”* (available at <https://www.justice.gov/archives/ncfs/page/file/1079121/download> (last accessed Jan. 26, 2023)).⁹

The NCFS therefore recommended that the Attorney General

direct all attorneys appearing on behalf of the Department of Justice (a) to forego use of these phrases when presenting forensic discipline testimony unless directly required by judicial authority as a condition of admissibility for the witness’ opinion or conclusion, and (b) to assert the legal position that such terminology is not required and is indeed misleading.

Id. The Attorney General adopted this recommendation on September 6, 2016. *Id.*; see also DOJ Memorandum (Doc. No. 455-5, at 6).

The NCFS’s recommendation was also based in part on growing recognition among scholars and courts that the phrase “reasonable scientific certainty” has no scientific meaning, is ambiguous and potentially misleading, and risks confusing the jury. See, e.g., *United States v. Glynn*, 578 F. Supp. 2d 567, 574 (S.D.N.Y. 2008); Paul Gianelli, *Scientific Evidence “Reasonable Scientific Certainty”: A Phrase in Search of a Meaning*, *Crim. Just.*, Spring 2010, at 40, 41; David H. Kaye, *The Double Helix and the Law of Evidence* 82 (2010) (characterizing the phrase as “legal mumbo jumbo derived from archaic cases in which lawyers discovered that if a medical doctor did

⁹ The defendant filed as an exhibit a preliminary report based on testimony before the NCFS rather than the final recommendation.

not utter the incantation ‘to a reasonable degree of medical certainty,’ his testimony might be excluded”).

Due to the phrase’s lack of precision and the likelihood of confusing the jury, the court holds that Fort, in presenting his testimony, may not use the phrase “to a reasonable degree of scientific certainty.” This portion of the defendant’s motion will be granted.

B. Fort’s Alpha Amylase Opinions

In his Report, Fort states that his test for the presence of alpha amylase on the 1c specimen was positive and that the diameter of the “clearing” produced in his radial diffusion test for the presence of alpha amylase “was more consistent with saliva than it was for urine or feces.” (Doc. No. 455-1, at 3.) The Report also states “with a reasonable degree of scientific certainty that the Alpha Amylase results from the serology testing were from saliva.” (*Id.*)¹⁰

Fort clarified in his deposition testimony, however, that he could not actually say that the amylase present on the specimen was produced by saliva as opposed to some other bodily fluid: “I can’t say specifically that it was from saliva, all I know is that there was amylase, that was the measurement of amylase.” (Fort Dep., Doc. No. 455-2, at 94; *see id* at 95 (agreeing that there is no “conclusive way to determine whether amylase was from saliva, as opposed to any other bodily fluid in which that enzyme was present”).) He nonetheless reconfirmed that he was of the opinion, based on his experience in conducting amylase testing and on the size of clearing in this case, which was related to the quantity of amylase present, that the amylase was more likely to be from saliva than from urine or feces. (*Id.* at 90–91, 93–95.)

¹⁰ As set forth above, Fort will not be permitted to testify using the phrase “with a reasonable degree of scientific certainty.”

The defendant maintains that (1) Fort should not be able to testify that the presence of amylase suggests the presence of saliva, because no test can confirm the presence of saliva; (2) his opinion that the amylase was more likely from saliva than from urine or feces should not be admitted, because it is based on his “experience” rather than on scientific “methods [that are] premised upon empirical evidence of validity” (Doc. No. 456, at 10–11); and (3) because Fort never went through any kind of proficiency testing with respect to radial diffusion testing, he cannot establish that he is “capable of reliably applying the method,” as a result of which his radial diffusion test results for the presence of alpha amylase should be excluded altogether (*id.* at 11–12).

The plaintiff does not actually object to the defendant’s first contention, as Fort himself testified that there is no way to confirm the presence of saliva or that alpha amylase on a tested specimen came from saliva. Instead, he can only state with certainty that alpha amylase is a digestive enzyme found in varying concentrations in bodily fluids that have a connection with the digestive tract. He objects to the defendant’s other two arguments on the basis that the radial diffusion test is widely accepted. Fort testified as to how he performed the test, that it was performed consistently with TBI protocol, and that his training and experience provide a valid basis from which he can draw the conclusion that Exhibit 1c tested positive for the presence of alpha amylase. He also maintains that he can permissibly opine that the presence of alpha amylase was more likely caused by the presence of saliva than by urine or feces, based on the diameter of the clearing produced, which is related to the quantity of amylase present.

The defendant appears to be challenging, not the validity or reliability of radial diffusion testing *per se*, but Fort’s ability to reliably conduct the testing. Fort testified, however, that he had received on-the-job training on how to perform the testing. He did not undergo proficiency testing,

but he did radial diffusion testing as part of the mock case he did in training, which his trainer observed. He did not know whether the TBI had conducted an internal validation study for its radial diffusion method of testing for the presence of alpha amylase, but he stated that the TBI had relied on the FBI's previous validation of the same type of test. (Fort Dep., Doc. No. 455-2, at 85–86.) The court finds that the defendant's objections regarding the lack of proficiency training and the absence of validation studies go to the weight of Fort's testimony but not its admissibility.

That is, the defendant is free to cross examine Fort as to these possible deficiencies, but Fort may testify that he performed the test, how he performed it, and that it revealed the presence of alpha amylase. As the Sixth Circuit has stated,

the requirement that an expert's testimony be reliable means that it must be "supported by appropriate validation—*i.e.*, 'good grounds,' based on what is known." *Daubert*, 509 U.S. at 590, 113 S. Ct. 2786. The task for the district court in deciding whether an expert's opinion is reliable is not to determine whether it is correct, but rather to determine whether it rests upon a reliable foundation, as opposed to, say, unsupported speculation.

In re Scrap Metal Antitrust Litig., 527 F.3d 517, 529–30 (6th Cir. 2008). Fort's testimony established good grounds and a sufficiently reliable foundation for his conclusion that his analysis of Exhibit 1c revealed the presence of alpha amylase on that specimen.

However, Fort's opinion that the presence of the enzyme was, in his experience, more consistent with saliva than with urine or feces appears, on the record now before the court, to be impermissibly based on speculation. Fort testified that there is no "standard concentration of amylase [he] would expect to see in saliva," as it "can vary from person to person." (Fort Dep., Doc. No. 455-2, at 90.) He was not even aware of a standard range; rather, "it's one of the things that just varies, so it's hard to say." (*Id.*) He agreed that the same could be said for other bodily fluids, with regard to which he could only say that "the concentrations of [alpha amylase] found in urine and feces would actually be less than what would be found in saliva." (*Id.*) Asked how

much less, “by what kind of margin,” he was unable to say with any degree of specificity. (*Id.*) He noted that he was aware of journal articles on which he relied for his “conclusions about the concentration levels,” but he did not identify them or explain what they concluded or how they reached their conclusions. (*Id.* at 91.) He testified simply that he would “normally see urine and feces on a lot lighter scale” when he was going through training—“just enough clearing that you knew it was being cleared, but not enough to really . . . measure it.” (*Id.* at 93.) Fort did not quantify his experience—he did not indicate how many times he had performed amylase tests on substances known to have been in contact with urine or feces or the quantity of urine or feces required in order to produce a positive test. And he could not point to any journal articles or empirical research on which he premised his conclusion that the clearing in this case was more consistent with saliva than with urine or feces, only his “past experience, that was it.” (*Id.* at 94.)

In sum, the court finds that Fort’s opinion that the alpha amylase present on the 1c specimen was more consistent with the presence of saliva than with urine or feces is not sufficiently reliable to be admissible. There is no indication that this conclusion is testable, that it has been peer reviewed in any sense, what the rate of error might be or how to mitigate it, or that his assumption as to the source of the amylase based on the diameter of the clearing has general acceptance in the scientific community. *Accord Gissantaner*, 990 F.3d at 463–66.

The defendant’s motion to exclude Fort’s testimony regarding alpha amylase will, therefore, be granted in part and denied in part. As set forth above, Fort will be permitted to testify about alpha amylase and the various fluids in which it is found, how he conducted the radial diffusion test, and that the test on Exhibit 1c yielded a positive result. He may not testify that the positive test was more likely to have resulted from the presence of saliva than from the presence of urine or feces or to his opinion “within a reasonable degree of scientific certainty” that it came

from saliva.

C. Fort's DNA Opinions

The defendant does not contend that Fort is not qualified to testify as an expert, nor does he contend that his testimony is irrelevant. Rather, the issue is whether his testimony is “reliable.” *In re Scrap Metal Antitrust Litig.*, 527 F.3d at 528–29. The defendant asserts very generally that Fort’s conclusions regarding the testing of the mixed DNA profile generated in this case are not the product of the “reliable application of reliable scientific principles and methods.” (Doc. No. 456, at 12.) The defendant specifically takes issue with Fort’s conclusion that “[w]ithin a reasonable degree of scientific certainty within the field of forensic biology the minor contributor to the DNA profile on the penile swabs taken from [JH] [was] Juan Cruz.” (Doc. No. 455-1, at 5.) The defendant, first, argues that this statement “grossly misrepresents the findings regarding the partial minor contributor profile obtained from the 1c swab,” as Fort acknowledged in his deposition that it would have been more appropriate to say that “the minor profile . . . matches Juan Cruz’s profile.” (Doc. No. 455-2, Fort Dep. 163; *see id.* at 164 (agreeing that he expected to testify that Cruz’s “profile is consistent with the minor contributor”).) The plaintiff does not seriously object to this revision and, as previously stated, Fort will not be permitted to use the phrase “within a reasonable degree of scientific certainty.”

To be clear, the defendant expressly concedes that STR typing of DNA is generally accepted as reliable by the forensic biology community. (Doc. No. 456, at 13.)¹¹ He nonetheless raises a large number of convoluted arguments, the vast majority of which are lifted verbatim from

¹¹ The Sixth Circuit has expressly found DNA testing to be reliable. *See United States v. Eastman*, 645 F. App’x 476, 481 (6th Cir. 2016) (“More than ten years ago, we noted that ‘[t]he use of nuclear DNA analysis as a forensic tool has been found to be scientifically reliable by the scientific community for more than a decade.’” (citing *United States v. Beverly*, 369 F.3d 516, 528 (6th Cir. 2004))).

a report generated by Dr. Dan Krane, his proposed expert. The defendant insists that the Sixth Circuit has not directly addressed the testing of low amounts of input DNA or its combined use with a Combined Probability of Inclusion (“CPI”) calculation for assigning statistical weight to a conclusion about the minor contributor’s profile. (*Id.* at 13 n.17.) In summary, the defendant argues that: (1) Fort cannot establish that sufficient amounts of DNA were present from the minor contributor to produce reliable results; and (2) Fort’s STR DNA typing analysis of the minor contributor profile was not premised upon reliable, empirically grounded methods, because (a) his interpretation of the mixed profile was subjective and not based on any validated methodology; (b) allelic peaks below the stochastic threshold cannot be relied upon for the purposes of inclusion in the statistical calculations of the probability that the minor contributor profile matched that of Cruz; and (c) the CPI methodology was not applied using reliable scientific methods and principles. In response, the plaintiff points out that Cruz’s arguments are largely premised upon the erroneous presumptions that the DNA testing in this case involved extremely low quantities of DNA, referred to as “low copy number” or LCN, meaning suboptimal amounts of DNA that render testing more difficult and less reliable and, relatedly, that Fort relied on results that fell below the stochastic threshold.

On that point, the court finds that the defendant’s assumption that this case involved LCN testing is not substantiated—or rather, is substantiated only by the opinion of the defendant’s expert, which is refuted by Fort’s opinion.¹² This is an issue that can be resolved by a jury through

¹² Much of the math in the defendant’s Memorandum is confusing, and some of it is simply incorrect, including the presumption that the total amount of DNA present in the sample was “quantified at .325 ng, equivalent to between 46 and 54 cells worth of DNA.” (Doc. No. 456, at 35.) As Fort explained, the total amount present was .0325 ng *per microliter*, in a buffer of 50 microliters (Fort Dep., Doc. No. 455-2, at 120.) Multiplying .0325 by fifty yields 1.625 ng total, not .325 ng, as the defendant represents. The plaintiff also points out that in *McCluskey*, an LCN case in which Dr. Krane was also identified as an expert, *see McCluskey*, 954 F. Supp. 2d at 1276,

rigorous cross examination of both experts at trial. Likewise, all of the defendant's challenges in this case to Fort's conclusion that the minor contributor's DNA profile was consistent with Cruz's profile go to the weight to be accorded his opinion rather than to the admissibility of the opinion. *Accord Eastman*, 645 F. App'x at 481 (noting that an opponent can challenge the admissibility of DNA evidence "by showing that its reliability is undermined by procedural error—failure to follow protocol, mishandling of samples, and so on," but, in the absence of that type of showing, the trial court did not abuse its discretion by admitting the expert testimony"); *Beverly*, 369 F.3d at 531 (holding that the district court did not abuse its discretion in admitting mtDNA test results where the "scientific basis for the use of such DNA is well established," and "[a]ny issues going to the conduct of the specific tests in question were fully developed and subject to cross examination"); *see also McCluskey*, 954 F. Supp. 2d at 1244 (where the methodology employed is deemed reliable, challenges to the particular procedures and instrumentalities used in applying the method "go primarily to the weight of the DNA evidence and not to admissibility" (collecting cases)).

In sum, this portion of the defendant's motion, too, will be granted in part and denied in part. The modifications required of Fort's testimony will be largely cosmetic: he will not be permitted to use the phrase "reasonable degree of scientific certainty," and he may not state that Juan Cruz "is" the minor contributor, but he may testify that, in his opinion based on his analysis of the DNA test results, Cruz's DNA profile is consistent with that of the minor contributor. In other respects, the defendant's motion to exclude Fort's DNA evidence will be denied.

the amount of DNA at issue there was 215 picograms. A picogram is one hundredth of a nanogram, so 215 picograms equates to .215 ng. *See id.* at 1278.

D. Rule 403

The defendant argues, in the alternative, that Fort’s proposed testimony should be excluded under Rule 403, on the basis that, if it is admitted, Cruz will suffer unfair prejudice that far outweighs the potential probative value of the evidence. In support of this assertion, he argues that the amylase and DNA test results were “weak,” untrustworthy, and potentially misleading, particularly given the “complexity of forensic evidence and the ‘aura’ that surrounds DNA testing.” (Doc. No. 456, at 34–36.)

As the Sixth Circuit has recognized, “for a Rule 403 violation to occur, the admitted evidence must result in ‘unfair prejudice’ in that ‘the evidence must suggest a decision on an impermissible basis.’” *United States v. Bonds*, 12 F.3d 540, 567 (6th Cir. 1993) (quoting *United States v. Schrock*, 855 F.2d 327, 333 (6th Cir. 1988)). In this context, unfair prejudice “does not mean the damage to a defendant’s case that results from the legitimate probative force of the evidence; rather it refers to evidence which tends to suggest decision on an improper basis.” (*Id.*; quoting *Schrock*, 855 F.2d at 335). In this case, the proposed expert evidence is “clearly probative” as it tends to substantiate the plaintiff’s claim that he was sexually assaulted. Further, while “[t]he aura of reliability surrounding DNA evidence does present the prospect of a decision based on the perceived infallibility of such evidence, especially in a case such as this where the evidence is largely circumstantial,” *id.* at 567–68, that conclusion does not require its exclusion, where the evidence at issue is scientifically valid. The defendant will have the opportunity to cross examine Fort “to show why [his] results were unreliable, the procedures flawed, and the DNA evidence not infallible.” *Id.* at 568. Rule 403 does not operate to bar Fort’s testimony.

IV. CONCLUSION AND ORDER

As discussed above, Fort’s actual proposed opinions in this case are very narrowly limited, at least insofar as they are encapsulated in the Official Report generated shortly after he concluded

his testing. These are simply, as relevant here, that (1) the JH penile swab, Exhibit 1c, indicates the presence of alpha amylase; (2) the DNA profile obtained from the same Exhibit 1c is consistent with a mixture of at least two individuals, a major contributor and a minor contributor; (3) the DNA profile of the major contributor matched the DNA profile known to be that of JH, to a statistical certainty; and (4) the minor contributor's profile is "consistent with" Cruz's profile, obtained from Exhibit 4a, insofar as the "probability of randomly selecting an unrelated individual who would be included as a contributor to the DNA mixture profile is approximately 1 in 2,109 for the African-American population, 1 in 759 for the Caucasian population, and 1 in 10,320 for the Southwestern Hispanic population." (Doc. No. 455-1, at 5–6.) Fort will be permitted to offer these opinions at trial.

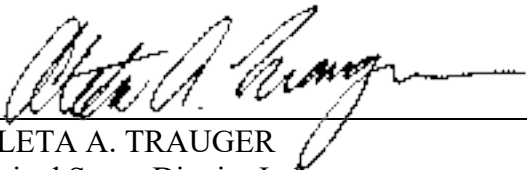
Insofar as the opinions expressed in his Report stray from the narrow path carved by his Official Report (as summarized in the Report), however, the defendant's Motion in Limine to exclude Fort's testimony and opinions is, for the reasons set forth above, **GRANTED IN PART AND DENIED IN PART**. The motion is **GRANTED** as follows:

1. In presenting his testimony, Fort may not use the phrase "to a reasonable degree of scientific certainty."
2. Fort may not testify that the alpha amylase detected on Exhibit 1c came from saliva or that it was more likely to have resulted from the presence of saliva than from the presence of urine or feces.
3. In presenting evidence regarding his DNA testing, Fort will not be permitted to use the phrase "reasonable degree of scientific certainty," and he may not state that Juan Cruz "is" the minor contributor, but he may testify that, in his opinion based on his analysis of the DNA test results, Cruz's DNA profile is consistent with that of the minor contributor.

In all other respects, the defendant's motion is **DENIED**.

The court reiterates that this ruling, like all rulings on motions in limine, is preliminary and may be revisited at any time and “for whatever reason [the court] deems appropriate.” *United States v. Yannott*, 42 F.3d 999, 1007 (6th Cir. 1994) (citing *United States v. Luce*, 713 F.2d 1236, 1239 (6th Cir. 1983), *aff'd*, 469 U.S. 38 (1984)).

It is so **ORDERED**.



ALETA A. TRAUGER
United States District Judge